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August

1984

Volume 5 Number 5

aS622.S6

Soil and Water Conservation News

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File Code

260-5

860-6

United States Department of Agriculture
Soil Conservation Service



Soil and Water Conservation News is the official magazine of the Soil Conservation Service. The Secretary of Agriculture has determined that publication of this periodical is necessary in the transaction of public business required by law of this Department. Use of funds for printing *Soil and Water Conservation News* has been approved by the Director of the Office of Management and Budget through January 31, 1987. *Soil and Water Conservation News* (ISSN-0199-9060) is published 12 times a year. Postage paid at Washington, D.C.

Magazine inquiries

Send inquiries to: Editor, *Soil and Water Conservation News*, Public Information Staff, Soil Conservation Service, U.S. Department of Agriculture, P.O. Box 2890, Washington, D.C. 20013-2890.

Subscriptions

Send subscription orders to: Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402

Comments:

*From the
SCS Chief*

Focusing Watershed Projects on High Priority Conservation Needs

We are directing our small watershed protection and flood prevention efforts at solving the Nation's most critical soil erosion problems, cropland and rural community flood problems, and farm water supply problems.

More than 90 percent of the watershed funds that we requested from Congress for this coming fiscal year were for projects that reflect these and other priorities identified in the National Conservation Program.

The response from Soil Conservation Service field and State office employees in meeting these objectives has been outstanding. The cooperation of conservation districts and the other local, State, and Federal agencies with whom we cooperate on watershed planning and protection also has been excellent.

To guarantee our continued success in solving high priority resource problems in watersheds, let's be on the lookout for new ways to help project sponsors acquire land rights, obtain State and Federal permits, and handle environmental concerns without delays in construction. Let's also help sponsors to achieve a better distribution of construction throughout the fiscal year.

Focusing our small watershed protection and flood prevention program on the worst problems first will give the most return for the time and money invested.



Cover: A small watershed project in Crawford County, Iowa. See Chief's Comments and articles on pages 2 through 5. (Photo by Tim McCabe, visual information specialist, Public Information, SCS, Washington, D.C.)

Small Watershed Projects

This is the first part of a three-part series on small watershed projects. Articles will cover how local sponsors apply for, plan, install, and maintain a project.

Introduction

The Watershed Protection and Flood Prevention Act, Public Law 83-566, authorizes the Secretary of Agriculture to give technical and financial aid to local organizations for planning and carrying out small watershed projects.

The Soil Conservation Service has primary responsibility for carrying out the program with assistance from local, State, and other Federal agencies.

In upstream watersheds of up to 250,000 acres, a small watershed project provides for resource development and helps to solve resource problems that do not require the kind of large projects needed in major river valleys.

A PL-566 project is planned and carried out by local, State, and Federal agencies with the support of landowners and citizens of the community.

Projects are based on local initiative and responsibility, Federal technical and financial assistance, State approval of local proposals, and State financial and other assistance.

Projects are a combination of land treatment, nonstructural, and structural measures designed to maintain the resource base, improve economic and social conditions, and enhance the environment. Structural measures include dams, levees, and grade-stabilization structures.

Since 1954, when PL-566 was enacted, many rural and urban communities have used the small watershed program to curb soil erosion and excessive runoff, reduce destructive floods, improve drainage on land in agricultural production, provide for more efficient irrigation, supply water for growing municipal needs, attract new industries, enhance fish and wildlife resources, and provide recreational opportunities.

So far, SCS and other cooperating agencies have assisted local sponsors in completing 604 small watershed projects around the Nation. As of June 1 of this year, work was progressing on an additional 595 projects, and sponsors had begun planning for another 154.

A Watershed Project for Your Community

Applying

Any legally qualified local organization may submit an application for a small watershed project. The application includes the size and location of the watershed, a description of the problem, the extent of damages, details about the work needed, and the source of local funds.

Assistance in preparing applications can be obtained at the local Soil Conservation Service office.

The local organization sends its application to the agency designated by the governor as the State clearinghouse and to the SCS State office.

Technical specialists from SCS, USDA's Forest Service, the U.S. Department of the Interior's (USDI) Fish and Wildlife Service, and other interested Federal and State agencies may be asked to examine the watershed site, depending on the problems identified in the application.

If the State agency disapproves the application, it notifies the local organization. If the application is approved, the agency sends it to the SCS State conservationist, who notifies the SCS Chief in Washington, D.C.

Based on planning priorities recommended by the State agency, the State conservationist makes preliminary investigations, reconfirms the local organization's desire to proceed with preparing a watershed plan, and recommends to the Chief that assistance in planning be authorized. The State conservationist notifies the local organization when assistance has been authorized.

Planning

SCS, the Forest Service, USDI's Fish and Wildlife Service, and other interested Federal and State agencies assist the local organization by making detailed field studies to define the task and to specify the costs and the benefits. The benefits must exceed the costs.

The local organization then prepares a watershed plan and environmental impact statement with SCS assistance. The

plan describes the problems; the proposed measures—how, when, and by whom they are to be installed; the environmental effects; and the methods of financing. After thorough review, both the local organization and SCS sign the watershed agreement.

If funds are available, the Chief can authorize operations to begin at once, provided that the estimated Federal contribution to construction costs does not exceed \$5 million, and the plan does not contain any single structure that has a total capacity of more than 2,500 acre-feet.

If the estimated Federal contribution to construction costs exceeds \$5 million or if the plan contains a single structure that has a total capacity of more than 2,500 acre-feet, the procedure is for the plan to be sent to the Office of Management and Budget for review and transmittal to Congress. Committees of the U.S. Senate and House of Representatives then must approve the plan before Federal assistance is made available.

Installing

The SCS Chief allocates funds for watershed projects from money appropriated each year by Congress.

For flood prevention, the Federal Government pays for all engineering and construction costs. Needed land treatment can be cost shared up to 50 percent for water quality purposes and up to 65 percent for erosion control.

For irrigation and drainage and for public recreation and fish and wildlife development, all engineering services and up to 50 percent of the construction costs are provided.

The sponsoring local organization is responsible for issuing bids and letting contracts for construction unless, at the request of the local organization, SCS has agreed to administer the contracts. Contractors build the structures and other works of improvement.

Once the works of improvement are installed, the sponsoring local organization is responsible for operation and maintenance. The organization must sign a written operation and maintenance

agreement before Federal funds are made available for any construction.

In certain circumstances, the Federal government pays up to 50 percent of the cost of the landrights and of the minimum basic facilities for public recreation or for public fish and wildlife development. All other costs, including those for municipal and industrial water supply and energy, must be paid by the sponsoring local organization.

The sponsoring local organization must obtain all landrights and permits needed for a watershed project.

It Takes Tough Sponsors to Make a Successful Watershed Project

"Complex" is when two States, four counties, two drainage districts, a watershed subdistrict, and a watershed improvement district sponsor a Public Law 83-566 small watershed project.

That's what sponsors of the Upper and Lower Little Black watersheds project in Missouri and Arkansas have discovered.

It all began in 1962 when a small group of farmers, some of them conservation district leaders, banded together to help reduce flood damages in the area.

The typical Ozark terrain was subject to frequent flooding during heavy rains when hundreds of small valleys funneled rapid runoff from higher pastureland and forestland onto bottom lands with poor outlets. Bottom land farmers had to replant their crops of mostly soybeans, corn, cotton, alfalfa, and wheat after floods destroyed them every 2 to 3 years.

The watershed project sponsors' first step in obtaining assistance in planning flood control for the region was to form a watershed subdistrict with taxing authority. To qualify for Public Law 566 assistance from the Soil Conservation Service, at least one sponsor of a watershed project must have taxing authority to pay its share of the project costs including operation and maintenance.

The soil and water conservation districts for Ripley, Butler, and Carter Coun-

ties in Missouri and Clay County in Arkansas then held public meetings in schools, churches, and townhalls in every community to gain citizen input and support for the watershed project.

In the early days of their efforts, sponsors convinced landowners that a series of small dams would work best. But SCS evaluations indicated larger but fewer dams would be more economical. Watershed project sponsors then convinced residents that fewer but larger dams was the way to go.

Watershed work plans had to be revised again when it was discovered that the region was in Earthquake Zone 2 with hazard from the New Madrid Fault. SCS redesigned the 25 floodwater dams to have wider tops, more freeboard, gravel drainage sections, and flatter side slopes, to withstand potential shifting during a quake.

Additional concerns of structural design and environmental considerations needed to be included in the watershed plan. These concerns delayed completion of the plan.

The Upper and Lower Little Black watersheds project was approved for operation on August 25, 1978, and construction began in spring 1980—18 years after the sponsors took the first step in planning the project.

Construction will entail 25 earthen floodwater retarding dams with concrete principal spillways and 85 miles of channel improvements. Two dams are completed and another two are scheduled to be completed by the end of the year. One is a multiple-purpose flood prevention and recreation dam. Permanent pools behind the dams are planned to range from 298 acres at some sites to 10 acres at others. Most reservoirs will be stocked with bass, bluegill, and channel cat.

Channel improvements will include stabilizing runoff ditches with 650 small drop structures to control the flow of water and reduce streambank and stream bottom erosion. The structures will also prevent gullies from forming in cropland.

Providing wildlife habitat was an important consideration in planning the channel work. Most of the channels will be

cleaned from one side only, and trees and brush will be left for wildlife habitat on the opposite bank.

Because the main channel is as much as 110 feet wide at some points, work will have to be done on both sides. To lessen the impact on wildlife habitat, a 30-foot strip along the length of the channel will be replanted to shrubs or woody species.

This main ditch will carry water from Neelysville, Mo., to the Current River below Success, Ark.

Watershed improvements will benefit about 425 farming units in Missouri and Arkansas in a total drainage area of more than 249,000 acres.

Crop damage will be eliminated in most areas from floods up to the 2-year frequency. Roads, bridges, houses, and businesses in several communities will also receive protection.

Some flooding will still occur in the Little Black watersheds, but most will come in early spring. Farmers can plant their crops and feel secure that they won't be flooded in July.

In the past, bottom land flooding has caused farmers' yields to vary widely from year to year, severely affecting farm income. The project is expected to reduce the frequency of flooding and allow for more uniform higher yields from year to year.

The total cost of the project is an estimated \$27 million with a benefit/cost ratio of 1.6 to 1.

"Success" is when, in spite of all the hard work and frustrations they faced, the sponsors of the Upper and Lower Little Black watersheds project stood their ground to make a better future for everyone who lives there.

Lane Thurman,
area conservationist, SCS, Houston, Mo.

Jerry Schwien,
public affairs specialist, SCS, Denver, Colo.

Michigan Watershed Projects to Give Erosion the Treatment

The Soil Conservation Service is helping local sponsors develop plans to reduce soil erosion through conservation tillage and other land treatment measures for the Bean Creek and Bear River Public Law 83-566 small watershed projects in Michigan.

The Bean Creek watershed includes 129,920 acres, much of it in corn and soybeans, in Hillsdale and Lenawee Counties. Bean Creek drains into the Tiffin and Maumee Rivers and then into Lake Erie.

On 33,800 acres of the watershed's cropland, wind and water erosion is causing annual soil losses of more than 10 tons per acre on the sandy loam and loam soils.

The Hillsdale and Lenawee Soil Conservation Districts are sponsoring the Bean Creek watershed project in an effort to reduce erosion and protect the land's productivity while decreasing production costs.

The project was authorized for planning assistance in 1982. SCS has worked with the districts in developing alternative watershed treatment proposals and will provide technical and financial assistance in carrying out an approved plan.

In their watershed proposal, project sponsors identified soil erosion, sedimentation, drainage, and agricultural waste management as their main conservation problems.

The watershed project will complement efforts by the U.S. Environmental Protection Agency, U.S. Army Corps of Engineers, and others to reduce offsite nonpoint source pollution. SCS and the districts are also working with the Michigan State Departments of Agriculture and Natural Resources.

Homer R. Hilner, SCS State conservationist in East Lansing, Mich., said, "A well-planned land treatment program in the watershed will reduce erosion on cropland and help improve water quality.

"Conservation tillage systems such as no-till and ridge-till, along with other land

management practices such as grassed waterways, grade stabilization structures, and diversions will be the key to solving the soil erosion problem," said Hilner.

The 81,000-acre Bear River watershed project, sponsored by the Emmet and Charlevoix Soil Conservation Districts, will be a land treatment project to reduce sedimentation in the Bear River. Bear River, in northwest lower Michigan, flows through Petoskey to Little Traverse Bay and Lake Michigan.

Wind and water erosion are severe on 17,000 acres, or two-thirds of the cropland in the Bear River drainage area. Average annual soil loss is 8.2 tons per acre, and much of it enters the river.

The project received approval for SCS planning assistance in 1983. The watershed project work plan being developed will include SCS technical and financial assistance to landowners to help them install diversions, waterways, windbreaks, and conservation tillage systems to reduce soil erosion to an acceptable level.

The conservation districts' no-till planter and seeder rental program will play an important role in achieving the watershed management goals to be outlined in project plans.

Roger Howell,
public affairs specialist, SCS, East Lansing, Mich.

Watershed Project Publication Reissued

The Soil Conservation Service has issued a revision of the publication "Multiple-Purpose Watershed Projects." The publication explains what a small watershed project does; how a community can get a project started; how projects are constructed, financed, operated, and maintained; what the Federal Government does; and what the local people do.

Copies are available from local and State SCS offices.

Soil Mapping in a Fog

San Clemente Island, one of eight Channel Islands 22 miles off the coast of southern California, was the site of a 2-year inventory of soils, plants, animals, and historic sites. The Soil Conservation Service made a special soil survey for the inventory, at the request of the U.S. Navy, which controls the island. The Navy uses San Clemente Island for undersea weapons and vessel training and general Naval training.

David Estrada, the SCS soil survey party leader, said, "Much of the soil mapping was done in heavy fog and sometimes the crew didn't see the sun for a week." This is typical of the island's maritime climate of cool summers and mild, moist winters. Precipitation varies only slightly. The island's lower elevations get about 7 inches of rainfall per year and the higher elevations receive about 10 inches.

Estrada said soil investigations on the island revealed 8 different soil series, 3 soil variants, and 43 map units. A soil series is the lowest category of soil classification and includes soils which are essentially alike. Soil variants are soils which are different in one or more features from a named series but occur in such a limited area that creation of a new series is not justified. Each map unit represents an area on the landscape and consists of component soils for which the unit is named.

Marine terraces are a dominant land surface on San Clemente Island. At least eight well-developed terraces occur on the northwestern side and up to 23 have been reported for the island as a whole. Most soils on the terraces of the island have a thin silt-loam surface layer and are underlain with clay at a shallow depth.

More recently developed land surfaces on the island include sand dunes and deep canyons. The canyons are a result of extensive geologic erosion by water, while the sand dunes developed from the accumulation of sand blown from the beaches.

Estrada said, "There were times when parts of the island were 'hot' and we couldn't map them until the bombing

stopped." He explained that "hot" means that the Navy training personnel were bombing the island from offshore war vessels as part of training operations.

Jan Larson, the Navy natural resources specialist who inventoried the plants, animals, and historic sites on the island, said, "We'll use the information to develop the long-range resource management plan for the island." This soil survey and resource inventory should help to save money and time in locating suitable building sites, choosing proper building materials, aiding in critical area planting, and identifying soils that support the rare and endangered plants.

Island vegetation consists mainly of purple needlegrass, a perennial plant, along with many of the annual grasses and forbs native to California.

After observing the many lichens on the island's rocks, Larson said, "There are as many species of lichens on the island as there are higher plants." All told, there are 14 plant species that grow only on San Clemente Island, 4 of which are endangered, and 29 species that are unique to the Channel Islands.

Warren Peden, SCS California State range conservationist, and Henry Adams, SCS range conservationist, were also on the soil survey team. They reported that range clipping data revealed total annual

forage production on the island ranged from 2,000 to 5,000 pounds per acre per year. Differences in production can be attributed to variations in soil depth.

Shrub species are increasing because in 1980 about 30,000 feral goats were removed from the island. Shrubs that are returning include chamise, buckwheat, buckthorn, cholla, baccharis, and Australian saltbush.

The island's wildlife, which needs to be carefully managed, includes the remaining goats and a number of wild pigs, deer, and feral cats. Two animals unique to San Clemente Island are the threatened Island Night Lizard and the rare San Clemente Island Fox.

Because of the high cost of travel, the soil survey crew stayed on the island for 2- to 3-week periods. Estrada said, "This meant living in the Navy barracks and eating in the mess hall with the military personnel. For many of us, this brought back memories of service past."

A limited travel budget, military restrictions, and the island's remoteness made this one of the more unusual resource inventories SCS has undertaken.

Jason N. Jackson,
soil conservationist, SCS, Ramona, Calif.



Henry Adams (left), SCS range conservationist, and David Estrada, SCS area soil scientist, estimate forage production on San Clemente Island.

American Samoa Soil Mapping Leads to Surprises

Finding the unexpected, such as soils of the Mollisol order, in the tropical islands of American Samoa, and meeting people like Sanele Fidow and Malaeti'a Misa, help make soil surveying interesting.

Fidow and Misa, extension agents with American Samoa's Department of Agriculture, were guides and interpreters for Soil Conservation Service soil scientists during a soil survey of the territory of American Samoa.

Samoan officials requested the soil survey after planners found a need for more data on soil resources. The survey is a cooperative effort of the Government of American Samoa and SCS. American Samoa lies south of the equator and 2,300 miles southwest of Hawaii. In most locations rainfall averages about 150 to 200 inches annually. The temperature hovers around 80° F, with summer afternoon temperatures in the upper 80's, "falling" to the mid-80's during winter. The heat and humidity give an ideal environment for lush vegetation.

In 1981, we started off the survey with the necessary contacts with governmental officials and initial soils descriptions. We were soon joined by Michael Roybal and Clarence Chavez, SCS soil scientists detailed from New Mexico. Roybal and Chavez subsequently spent 4 months

mapping the soils of the islands.

While on the main island of Tutuila, we lived in government housing. On the other islands we lived with Samoan families and feasted with Samoan chiefs.

We surveyed the five volcanic islands of Tutuila, 'Aunu'u, Ta'ū, Ofu, and Olosega, with a total area of 48,768 acres. Most of American Samoa is very steep and rugged.

All four of us were intrigued by the Mollisols found there. We expected the heavy rainfall would leach too much of the base elements from the soil to have the high pH characteristic of Mollisols. Instead in Samoa, we found that the decay of organic matter and the weathering of volcanic rocks replenished the bases as fast as they were leached.

We chopped through dense rain forest, waded through coastal marshes, and hiked the steep volcanic slopes. Many areas were accessible only by overgrown foot trails. These could lead unexpectedly to small farm plots, many located on very steep slopes, some as steep as 80 percent.

Farming in American Samoa is mainly for subsistence. Taro, breadfruit, banana, and coconut are the main crops. They are commonly grown in mixed plantings to suit a family's needs.

Planting is done with a digging stick,

and weeds are cut with bush knives or pulled by hand. There is no machine cultivation, and no commercial fertilizer or soil amendments, such as lime, are used. This kind of "no-till" farming uses volunteer weeds for a cover crop and mulch to maintain organic matter and control erosion. The organic matter is an important source of plant nutrients in tropical soils, especially where no fertilizer is added. When production drops, the land is left to rest until it regains fertility.

While the Samoans are generally doing the best they can under the circumstances, there are soil erosion problems caused by clearing and cultivating steep land. The recently published soil survey will be the foundation for efforts by American Samoa's Department of Agriculture to reduce this erosion.

Saku Nakamura,
soil scientist, SCS, Hilo, Hawaii

Paul Bartlett,
soil scientist, SCS, Honolulu, Hawaii



At left, Pago Pago, American Samoa, the center of government and business, is on a narrow coastal fringe. The steep slopes in the background are typical of the rugged volcanic islands. At right, the soil survey party, led by a Samoan guide and interpreter, treks through a taro and banana plantation.



First National Conservation Tillage Conference To Be Held

Secretary of Agriculture John R. Block will deliver the keynote address for the first national conservation tillage conference called by the U.S. Department of Agriculture and more than 60 national organizations, to be held October 3 through 5 in Nashville, Tenn. Secretary Block announced the conference last year as part of USDA's 1984 national conservation campaign.

U.S. Congressman Ed Jones (D-Tenn.), who chairs the House Subcommittee on Conservation, Credit, and Rural Development, will also speak at the opening ceremonies. Soil Conservation Service Chief Peter Myers will lead a session on what conservation tillage means to agriculture.

More than 1,000 participants are expected, representing farm and commodity groups, farm suppliers, conservation and environmental groups, professional and scientific associations, State governments, and the Federal Government.

Participants will examine the adoption of conservation tillage practices and their current and future effects on farming, the environment, agribusiness, and public policy. They will also look at the economics of conservation tillage, the latest technological developments, and ways to reach more farmers.

Registration materials are available from Peter Smith, Room 242-W, U.S. Department of Agriculture, Washington, D.C. 20250. Or call him at (202) 447-5166.

Sediment Study Conducted for Potomac Estuary

Researchers in the Washington, D.C., metropolitan area have studied more than 200 years of data on sedimentation in the Potomac Estuary and concluded that some of the sediment causing problems today eroded from farms in the 1800's and early 1900's.

Using a computer model to analyze historical data, including anecdotal data, the scientists found sediment loads remained high long after erosion rates peaked around 1900. Jim Smith, a hydrologist for the Interstate Commission on the Potomac River Basin which provides personnel for the study, says this is because some sediment moves very slowly in and out of storage in flood plains and channels. As an example of the anecdotal data used in the study, Smith cites data from researchers who traced mercury attached to sediment after a 1977 mercury spill in the south fork of the Shenandoah River.

The researchers also used data from core samplings of sediment layers, reservoir sedimentation surveys, and measurements of suspended sediment taken by the U.S. Department of the Interior's Geological Survey.

Smith says the data, some of which came from the Soil Conservation Service, show that the soil conservation movement which began in the thirties and the decline of farming in the Potomac River Basin have greatly reduced the amount of new sediment entering the water. Smith says erosion control will show no immediate benefits for the Nation's river, but it is important in the long run, especially for Maryland's Piedmont where farming and soil erosion are concentrated.

The computer analysis of sedimentation data is the first part of a major research project begun in 1983. The Metropolitan Washington Council of Governments is coordinating the research for the District of Columbia government, State and affected county governments of Maryland and Virginia, and Federal agencies.

The focus of the study has shifted from nutrients attached to sediment to nutrients dissolved in water, which the researchers hope is a problem with more immediate solutions. The results will help those who want to set an example for east coast estuaries by cleaning the Potomac Estuary and its outlet, the Chesapeake Bay.

SCS Simplifies Great Plains Conservation Program Regulations

Following the trend toward briefer Federal regulations and more flexibility for States, the Soil Conservation Service has halved its Great Plains Conservation Program (GPCP) rules and given SCS State conservationists more authority.

SCS removed the national list of conservation practices eligible for GPCP cost sharing from the rules, along with details covered by contracts. SCS State conservationists, in consultation with GPCP committees, can now make their own lists and set maximum cost-share rates for each practice, not to exceed 80 percent. The State conservationists can choose any of the practices listed in SCS field office technical guides.

At the county level, SCS district conservationists, in consultation with GPCP committees, can choose eligible practices from the State lists and set maximum cost-share rates, not to exceed State rates.

The GPCP provides cost-sharing and technical assistance for eligible practices to land users who have developed acceptable conservation plans for their entire farms or ranches. The SCS Chief designates eligible counties within the Great Plains States based on their susceptibility to serious wind or water erosion.

SCS made other rule changes to update financial management procedures to conform to current fiscal policies.

In revising the rules, SCS considered public responses during the 60-day comment period after the proposed rules were published in the Federal Register last year.

For more information, contact Richard Reed, Land Treatment Program Division, Soil Conservation Service, USDA, P.O. Box 2890, Washington, D.C. 20013-2890.

Donald L. Comis,
assistant editor, *Soil and Water Conservation News*, SCS, Washington, D.C.

Striking a Balance Between Development and Open Space

In the past, random subdivision and development of land led to losses of valuable farmland, frequent farmer-homeowner conflicts, and increased burdens on municipal utility services. The results were direct conversion to other uses, or fragmentation, and loss of the foundation of agriculture.

Perhaps nowhere was this more evident than in New Jersey, where urbanization claimed 127,000 acres from 1967 to 1977. Old zoning and land use laws for agricultural lands frequently allowed unregulated development, thus encouraging this process.

Small municipalities near suburban areas across the country increasingly face the difficult task of planning for orderly growth. Many municipalities have approached this problem by regulating the size of building lots in rural areas. In New Jersey, minimum lot sizes of 2 to 5 acres in agricultural or rural zones are not uncommon. This frequently does little but make home ownership more expensive, and in many cases contributes to additional fragmenting of available farmland. Costs for municipal services can increase, as can the potential for conflicts with the farm community.

One of New Jersey's more agriculturally oriented areas, Upper Deerfield Township in Cumberland County, has not been immune to these problems. Pressure for development comes from the growing Bridgeton-Vineland-Millville urban area. In addition, food processing plants and agriculture—mainly truck farms—contribute to a significant portion of the local economy.

A few years ago, committing themselves to maintaining a balance between residential and commercial growth and a viable agricultural industry, the township committee enacted a stringent zoning and development code. One of the cornerstones of this code was the creation of agricultural zones to help preserve agriculture. The intent also was to reduce nuisance claims originating from the in-

compatibility of agricultural and nonagricultural uses, and to protect and maintain valuable soils capable of supporting highly productive agricultural activities.

Using data provided by the published Cumberland County Soil Survey, crop productivity indexes, and an important farmlands inventory, township planners assembled a zoning and development plan map that includes the most productive soils area within agricultural zones. This was no easy task, since 90 percent of the township was considered prime farmland.

As stated in the code, areas scheduled for development must not involve land that is generally suitable for farming unless it is along an existing public road. Certain parcels of land can be judged unsuitable for commercial farming because of a small size or irregular shape. On land that is unsuitable for farming, the minimum lot size is one-half acre, making housing more affordable and urban services more efficient.

Township officials consider the regulations a success. The officials are proud of the balance their township offers between development and open space. As proof of their commitment to the agricultural economy, they sold a large commercial development at a township auction with the stipulation that the new owner use the property for the storage or processing of agricultural goods or supplies. Upper Deerfield Township is determined to keep the "garden" in the Garden State of New Jersey.

Anthony Fernandez,
district conservationist, SCS, Seabrook, N.J.

Land, Pasture, and Range Judging Contest Held

The 33rd Annual Land, Pasture, and Range Judging Contest held outside Oklahoma City, Okla., May 2-3, attracted more than 700 contestants from 33 States. Sixteen of the States produced award winners. Four grand champions were from Indiana, three from Oklahoma and Texas, and one each from Kentucky, West Virginia, New Mexico, Florida, and Tennessee.

The contest, held this year on a ranch near Mustang, Okla., involves three judging events: land judging, pasture and range judging, and homesite evaluation. Each event has three divisions: 4-H and Future Farmers of America (FFA), competing both as teams and individuals; and adults. Contestants evaluate topsoil, subsoil, slopes, and other characteristics and recommend treatment to improve the land's adaptability for certain purposes.

More than 200 awards of cash, trophies, and medals were awarded by the Federal Land Bank of Wichita and its affiliated land bank associations in Oklahoma, Kansas, Colorado, and New Mexico, primary sponsors of the event.

Joined in conducting the contest were people from Oklahoma 4-H, FFA, Soil Conservation Service, Oklahoma State University, and numerous other agricultural organizations.

This year's annual honoree was Don Bartolina, SCS district conservationist, Oklahoma City field office. Bartolina has been involved in the contest for more than 20 years, first as a soil scientist and for the past several years as the district conservationist where the contest is held.

All SCS employees in the State were also given special recognition at the awards banquet. Roland Willis, SCS State conservationist, was presented a plaque by the Federal Land Bank recognizing the many contributions SCS has made to the success of the contest during the past 33 years.

F. Dwain Phillips,
public affairs specialist, SCS, Stillwater, Okla.

Measuring Ephemeral Cropland Gullies

All over Louisiana this past spring, Soil Conservation Service personnel have been grabbing cameras after torrential rains to photograph "ephemeral cropland gullies" before the gullies are hidden by planting operations.

This photographic documentation is part of a multi-State study by SCS of ephemeral cropland gully erosion, a previously uncounted but major form of erosion caused by the concentrated flow of runoff. The gullies are called "ephemeral" because they are covered by tillage and reappear after harvest, the next spring, or anytime after heavy runoff from snow or rain.

Unlike rills, which occur randomly, these gullies reappear in the same places, in depressions where water collects. Although the gullies are ephemeral, their effects are not. SCS first measured them in 1982, in Alabama, where they found some fields in which the gullies moved as much soil as sheet and rill erosion did. Now SCS is measuring the gullies in several States.

SCS National Sedimentation Geologist William Mildner, in Washington, D.C., says, "After one of these gullies has existed for a few years, the area from which soil has been removed can be 100 feet wide or more."

Early results from Louisiana show a serious problem there. B. Arville Touchet, the SCS State soil scientist for Louisiana, says he expects to see areas where ephemeral cropland gully erosion moves at least twice as much soil as sheet and rill erosion does.

Touchet says this will be where spring rains fall on bare, erodible soils. Touchet sees the studies—which are being done in 27 soil and water conservation districts in 5 major land resource areas—as the first step toward finding solutions.

Touchet says SCS personnel are using photographs to help farmers see the problem in its early stages when control is cheapest. He says the solutions may involve different combinations of practices such as conservation tillage,

grassed waterways, terraces, and underground tile outlets. He believes measuring this type of erosion will show the true soil-saving benefits of such practices, which have been greatly underestimated wherever ephemeral cropland gully erosion is severe.

The underestimation of soil erosion in parts of the Nation and the need for a general refinement of soil erosion prediction techniques caused SCS to make ephemeral cropland gully erosion prediction one of its highest priority research needs.

The USDA Agricultural Research Service (ARS) National Soil Erosion Laboratory at West Lafayette, Ind., is taking the lead on finding better ways to predict soil erosion. The National Soil Erosion Lab is doing this in consultation with similar research at other ARS locations including Oxford, Miss.; Ames, Iowa; Pullman, Wash.; and Tucson, Ariz.

The research is part of a new approach to erosion prediction that takes advantage of computer modeling techniques. The new models will predict ephemeral cropland gully erosion and all other forms of water erosion on a landscape, as well as predicting sediment deposition and sediment yield.

This contrasts with the Universal Soil Loss Equation (USLE) which only estimates sheet and rill erosion. Klaus Flach, SCS special assistant for science and technology, says the USLE is still "quite useful and accurate; but if there are to be major improvements in erosion prediction, a different approach is needed."

Donald L. Comis,
assistant editor, *Soil and Water Conservation News*, SCS, Washington, D.C.

Volunteers Build Hospital Recreation Complex

In the fashion of an old barn-raising affair, contractors, engineers, State and Federal Government employees, and local community members pitched in to create an outdoor recreation complex for a hospital for the physically handicapped in southeastern Massachusetts.

The outdoor complex constructed on the Lakeville Hospital grounds in Lakeville, Mass., offers a number of facilities designed for handicapped as well as nonhandicapped people, including a 120-by 80-foot pond with a fishing pier, a nature trail with six exercise stations, and two picnic pavilions. These facilities are open to the public.

The New England Chapter of the Land Improvement Contractors of America (LICA) sponsored the Lakeville Hospital Outdoor Complex as its 1983 annual project. LICA built the complex in one weekend with help from local community groups and businesses, the Massachusetts Correctional Institute in Plymouth, plus staff members and patients of the Lakeville Hospital.

The Soil Conservation Service staff in Raynham, Mass., provided the technical planning and engineering design work for the project, working through the Plymouth Conservation District.

Marc MacQueen, SCS district conservationist in Raynham, noted the hard work and donations that made the project possible. According to MacQueen, "more than 20 LICA contractors lent their time, effort, and equipment to make the project a reality. Local people provided more than 700 gallons of fuel, 500 cubic yards of stone dust for the paths, 1,500 board feet of wood for the fishing pier, eight picnic tables, grass seed, fertilizer, and much more."

Finding anything for free in this day and age is rare, yet LICA pulled together a project valued at more than \$100,000. According to Merton Howes, LICA chapter president during the project, "these LICA field days contribute a public service in addition to enabling LICA to test

new techniques and equipment, to promote land improvement and conservation practices, and inform the public of our existence and availability for contracting similar work."

Community service organizations and volunteers also contributed several week-ends of time before and after the main construction event. According to Stephen Fitzgerald, assistant director of Lakeville Hospital, some of the most dedicated workers were minimum security prisoners from the Massachusetts Correctional Institute.

The construction of the Lakeville Hospital Outdoor Complex has been especially exciting for the patients and staff of the hospital. The new facilities have opened the door to a range of potential programs which may heighten the physical, intellectual, and spiritual experiences of the patients.

Fitzgerald says, "The community has also come alive with these new programming opportunities, with individuals offering time and talents for such things as outdoor and environmental education, and even horseback riding for paraplegic patients."

All who have been involved with the outdoor complex deserve the highest commendations, for it was truly not just another project—it was a joint community effort which created a glimmer of light in the lives of some special individuals.

Deborah K. Johnson,
public affairs specialist, SCS, Amherst, Mass.

Ramona Sharron,
work-study student, University of Massachusetts,
Amherst, Mass.

To Save a Dream

Most people dream. When they die, their dreams die with them. Louis Stelzer had a dream. When he died, his dream stayed behind and began to blossom. Last year, this dream was realized when a special park for special people officially opened.

The San Diego County Parks and Recreation Department built the 314-acre Louis A. Stelzer Park near Lakeside, Calif., to meet the needs of handicapped as well as nonhandicapped persons.

Stelzer, a local architect and businessman, originally purchased the property for a family retreat. Upon his death in 1972, Stelzer's will stipulated the land be donated to San Diego County, "... for the proprietary but not exclusive use of crippled and needy children..."

When the park was completed 11 years later, the Parks and Recreation Department saw that a serious potential problem could destroy this new recreation area that cost \$1 million to build.

The problem was simple—barren areas of sandy soil that would be unprotected from winter rains. Erosion could literally wash away Stelzer's dreams and more than a decade of work.

The park is located on hilly terrain with cut slopes and banks in relatively dry, sandy soil. Most of the western edge of the park is bordered by Wildcat Canyon Creek. With much bare ground left after construction and a natural tendency for water to flow in the park area, conditions seemed right for losing soil and money—down the drain.

To stop such a loss, park officials called on the Soil Conservation Service for technical assistance. Working through the Greater Mountain Empire Resource Conservation District, SCS Soil Conservation Technician Wayne Mall, in San Diego County, helped Park Supervisor Doug Ruth prepare a conservation plan for erosion control. The plan includes critical area seeding, mulching, brush management, and other measures. To direct water from the cut slopes, Mall recommended diversion ditches lined with stones found in the park.

Determining that vegetative planting would protect most of the bare areas, SCS turned to their Plant Materials Center (PMC) in Lockeford, Calif., for suggestions. The Lockeford PMC tests newly developed grasses and other plants for conservation benefits. To see how plants survive under different field conditions, the PMC tests them at sites with different climates and soils. As luck would have it, the PMC had released a variety of grass seed, 'Zorro' annual fescue, which needed to be tested in a dry climate and sandy soil similar to that of Stelzer Park.

The San Diego Parks and Recreation Department offered its new park as a planting test site and SCS agreed to provide the necessary equipment and personnel for the seeding. The PMC also suggested inclusion of another of its released plants, 'Blando' brome, and the parks and recreation department added California-poppy and rose clover.

Within 2 days, SCS had seeded all the bare areas. Laborers from a nearby prison camp then tacked excelsior matting over the entire seeded area to hold the seed mixture in place during establishment. When the November rains came, the seed germinated right on schedule.

The grass is now intercepting raindrops and reducing erosion, insuring a future for Louis Stelzer's dream.

Don Tweedy,
public information specialist and soil conservation
technician, SCS, Escondido, Calif.

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New Publications

Foothills for Food and Forests

Edited by David
B. Hannaway

Foothills for Food and Forests is the result of an international hill land symposium held at Oregon State University in April 1983. The book is composed of the presentations delivered at the symposium. Emphasis has been placed on the virtually intractable management problems that foothills create because of their steepness.

The purpose of the book is to present valuable information on the work that researchers, ranchers, farmers, and foresters have been involved in in their attempt to grow and harvest in the economically rewarding system which foothills are capable of producing.

According to the book, this system depends on growing biomass in two dimensions: horizontally on the land surface in a permanent legume/grass forage crop harvested by domestic and wild animals, and vertically as tree bio-mass harvested periodically for wood fiber.

This publication is available for \$34.95 from Timber Press, P.O. Box 1631, Beaverton, Oreg. 97075.

Land-Saving Action

Edited by Russell L. Brenneman
and Sarah M. Bates

Land-Saving Action is a written symposium of the latest articles on all aspects of private land conservation. It includes 34 papers from 29 contributors.

Part I offers case studies of particular private efforts and success stories in land conservation and historic preservation.

Part II deals with the particulars of creating and managing a land-saving organization.

Part III offers specific advice on the details, legalities, and varied components of arranging and completing a conservation transaction. It also describes the role of private development as a protection device, complete with case studies.

Part IV covers federal taxation and presents a number of different perspectives on various facets of the tax code and their influence on land-saving programs.

Part V guides the individual landowner through the options and procedures open for land preservation.

Land-Saving Action is available for \$34.95, plus \$1 for shipping and handling, from Island Press, Star Route 1, Box 38, Covelo, Calif. 95428.

Integrated Brush Management Systems (IBMS): Concepts and Potential Technologies for Running Mesquite and Whitebrush

by the Texas Agricultural
Experiment Station

This research report describes herbicide-fire based systems applied with decision-deferment grazing for improving South Texas rangeland. The rangeland supported excessive covers of whitebrush or the running mesquite complex (a shrub type composed of a mixture of decumbent honey mesquite and screwbean).

The report provides an introduction; gives the conceptual basis for IBMS; and presents the problem, research objectives, materials and methods, and results and discussion.

In the summary, the researchers report that "herbicide-fire combinations appear promising for improving rangeland supporting excessive cover of run-

ning mesquite or whitebrush. Herbicide application initially reduces the brush cover and releases herbaceous vegetation to serve as fine fuel as well as increasing livestock carrying capacity. Prescribed burning expedites forage production, improves botanical composition of herbage stands, and suppresses brush regrowth and reinvasion by woody seedlings. This research indicates that such sites may be burned at 3- to 5-year intervals during periods of average rainfall."

Single copies of the report are available at no cost and may be ordered from the Department of Agricultural Communications, Reed/McDonald Building, Room 101, Texas A&M University, College Station, Tex. 77843.

The Private Sector Role in Rural Outdoor Recreation in the United States

by H. Ken Cordell and
Barbara Stanley-Saunders

Because government is becoming less able to provide outdoor recreation opportunities, the authors of this publication felt it necessary to create a bibliography that would assist in determining how and where the private sector has been involved in outdoor recreation. This bibliography lists literature that describes the private sector's role in rural outdoor recreation in the United States. It specifically emphasizes literature on the private sector from the pre-1950's through 1982.

The literature cited is primarily from natural resource periodicals and from Federal and State agencies, especially State agricultural experiment stations.

Subjects emphasized in the literature cited include financial aspects, often focusing on the economics of private sector operations, marketing strategies, and financial assistance. The fully annotated bibliography

should help those individuals who are interested in where the private sector's successes have been in outdoor recreation and what the issues and problems are in the development of rural outdoor recreation.

Copies of this bibliography may be purchased for \$15 from CPL Bibliographies, 1313 East 60th Street, Chicago, Ill. 60637.

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by the Soil Conservation Service

American Samoa

Arkansas: Baxter and Marion Counties; Fulton and Izard Counties; and Little River, Lafayette, and Miller Counties.

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Mississippi: Madison County.

Nebraska: Cass County.

Oregon: Gilliam County.

Pennsylvania: Somerset County.

South Dakota: Faulk County.

Texas: Austin and Waller Counties.

Washington: Grant County.

Wyoming: Laramie County.